



# Forest Health Protection

## Pacific Southwest Region



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**To: Forest Supervisor, San Bernardino National Forest**  
**Subject: Forest Health Conditions for 2008 (FHP Report # SC-09-04)**

Aerial surveys were conducted on the San Bernardino National Forest (SBNF) during the week of July 21<sup>st</sup>, 2008. Two days were devoted to surveying insect and disease mortality across the three districts. Forest Health Protection (FHP) assisted Forest Health Monitoring (FHM) with aerial detection and mapping efforts (map in Appendix 1; higher resolution Google Earth aerial data at <http://www.fs.fed.us/r5/spf/fhp/fhm/aerial/draft/index.shtml>). Ground surveys were conducted throughout the year to verify mortality mapped and to scout additional problems not detected during flights. The following report presents significant insect and disease problems surveyed in 2008 and relevant forest health issues elsewhere in southern California that may become concerns.

### Pine and fir bark beetles

Mortality caused by Jeffrey pine beetle, *Dendroctonus jeffreyi*, intensified from 2007 levels around Fawnskin (Fig. 1). Jeffrey pine beetle killed an estimated 186 trees spanning 279 acres. Current mortality is near Gray's Peak Trailhead. If drought conditions persist in 2009, tree mortality in this area will be expected to increase. Additional Jeffrey pine beetle-caused mortality was detected across the Mountain Top RD encompassing a total of 266 acres. Jeffrey pine beetle killed a total of 421 trees in areas of the San Geronio Wilderness, near Sugarloaf Mountain, and near Heart Bar campground.



Figure 1. Jeffrey pine, *Pinus jeffreyi*, killed by the Jeffrey pine beetle north of Big Bear Lake around Fawnskin.

Eighty-seven acres of Coulter pine, *Pinus coulteri*, were killed by the western pine beetle, *D. brevicomis*, on Thomas Mountain on the San Jacinto RD. The stand of Coulter pine is densely stocked and located in a marginal site. Mortality from western pine beetle will likely continue in these stands in 2009, but the area of mortality is not threatening recreational areas.

Mountain pine beetle, *D. ponderosae*, caused relatively little mortality on the SBNF in 2008. Mountain pine beetle killed lodgepole pine, *P. contorta*, near Grinnell Mountain and sugar pine on San Jacinto peak. Aerial surveys detected lodgepole pine mortality across 22 acres. Sugar pine mortality was limited to 8 acres. FHP will be collaborating with the Rocky Mountain Research Station to monitor mountain pine beetle populations on the Mountain Top RD in 2009.

Mortality caused by pinyon Ips, *Ips confusus*, was aerially detected near Onyx peak. Scattered mortality of single-leaf pinyon pine, *P. monophylla*, was detected across 43 acres, impacting 67 trees.

California fivespined Ips, *Ips paraconfusus*, killed knobcone pine in a plantation along Highway 330 (Fig. 2). High densities in knobcone pine stands and below-average precipitation most likely increased individual tree stress, making them more susceptible to bark beetle injury. Several windthrown trees located in the area also probably produced large numbers of Ips engraver bark beetles that subsequently injured and killed adjacent pines.



Figure 2. California fivespined Ips killing knobcone pine in dense stands along Highway 330.

Mortality from fir engraver, *Scolytus ventralis*, was not common on the SBNF, even though precipitation levels were below the yearly average. White fir mortality was aerially mapped along Grinnell Mountain where the fir engraver killed or top-killed 35 white fir.

### Other insect damage

California flatheaded borer, *Melanophila californica*, killed Jeffrey pine in 2007 in Holcomb Valley. Mortality was aerially mapped across 77 acres and impacted 95 trees. Additional Jeffrey Pine mortality from the California flathead borer was detected along Thomas Mountain where it killed a total of 219 trees.

Defoliation from the fruittree leafroller, *Archyps argyrosphila*, was common on California black oak, *Quercus kelloggii*, across the Mountain Top RD (Fig. 3). California black oak with high levels of defoliation were found around Camp Seely and Crest Park (Fig. 4). Ground and aerial surveys estimated 90 acres of defoliation. Drought conditions experienced in 2008 may have resulted in increased levels of defoliation. Tree mortality could occur if high levels of defoliation and drought continue for multiple years.



Figure 3. Caterpillar of the fruittree leafroller feeding on California black oak.



Figure 4. Defoliation of California black oak from the fruittree leafroller.

High densities of the black pineleaf scale, *Nuculaspis californica*, were detected south of Lake Arrowhead (Fig. 5). Scale populations caused premature needle loss and needle discoloration of sugar pine and Jeffrey pine. Populations of the black pine leafscale and associated injury have declined from 2007 levels. Twenty trees across five acres were found with dense scale populations. The pine needle scale, *Chionaspis pinifoliae*, was also found infesting white fir in the area, but at lower densities. High densities of scale populations can kill trees after several years or increase tree susceptibility to other mortality factors.



Figure 5. High infestations of the black pineleaf scale on sugar pine in the Lake Arrowhead area.

### Diseases

Single-leaf pinyon pine, *P. monophylla*, continues to be affected by black stain root disease, *Leptographium wagneri*, on portions of the SBNF where it has historically been a problem. Typical stain symptoms were found in the lower bole and roots of fading and recently dead trees of all ages at the edges of infection centers north and west of the Big Bear Discovery Center. Large numbers of infection centers had been previously reported in this area in a survey conducted in 1991. Regeneration is slow and sparse at the center of the expanding infection centers, in part due to persistent woody debris from downed trees killed by the disease.

A mistletoe removal project on the SBNF dramatically improved tree health, site aesthetics, and visitor safety in recreational areas. In this project, the SBNF had previously (2006) ranked all of its Forest Recreation Areas (Day Use Areas and Campgrounds) by need for oak mistletoe (*Phoradendron villosum*) and western dwarf mistletoe (*Arceuthobium campylopodum*) removal. Treatment of severely affected sites was accomplished through FHP funding and a Participating Agreement with the California Indian Manpower Consortium that allowed a crew from the Santa Rosa band of Cahuilla Indians to be hired and trained for tree climbing and pruning. The Forest Service trained the crew early in 2007, treatment started in 2007, and was completed by the end of June 2008; treatment was completed on the six sites identified in 2006 as having the most critical need for oak mistletoe removal. Decline and mortality have not subsequently been observed on the highly valued oaks at these popular recreation destinations.

### Potential and emerging insect and disease problems

#### Redhaired pine bark beetle detected

Trapping for the redhaired pine bark beetle, *Hylurgus ligniperda*, on the San Bernardino National Forest in 2008 detected the insect in the area of Stockton Flat on the Front Country RD. The redhaired pine bark beetle is exotic to the U.S., but native to southern and central Europe. The redhaired pine bark beetle was first detected in the Los Angeles Basin in 2003. It has not been associated with tree mortality. Redhaired pine bark beetle is a forest health concern because it may be a vector for black stain root disease. Surveys for this insect will continue to be conducted by Forest Health Protection and Pacific Southwest Research Station on the San Bernardino, Angeles, and Cleveland NF's in 2009.

### **Goldspotted Oak Borer, known on the Cleveland NF, to be surveyed**

The goldspotted oak borer (GSOB), *Agrilus coxalis*, is a new non-native pest to oaks in southern California. GSOB has been killing oaks on the Cleveland NF and surrounding lands since 2002. Aerial surveys have estimated >17,000 oaks have died in the past six years from this beetle. Surveys will begin on the SBNF in 2009 as part of a larger study to determine the beetle's range in southern California.

### **New alder canker disease in LA basin.**

In 2008, a new disease of alders was found in the Los Angeles basin by UC Riverside Extension pathologist Deb Mathews in diseased Italian alders at a number of landscape plantings. The pathogen, *Phytophthora siskiyousensis*, causes bleeding trunk cankers on the alder host and had only been identified once before in California. Distribution is currently unknown. SoCal Forest Health Protection would welcome information to locate sites where alders are declining or dying on the SBNF to determine whether the disease has been established on the forest.

### **Conclusions**

The Jeffrey pine beetle infestation around Fawnskin is the forest health problem most threatening high-use SBNF sites and adjacent private land. The remaining bark beetle activity on the forest is not an immediate concern and may subside in 2009 with ample precipitation. However, if average rainfall is not received this year, existing pockets of mortality could increase where tree density is high.

If there are additional areas of mortality or forest health concerns that require monitoring or assessment, please contact Forest Health Protection personnel.

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Appendix 1. Tree mortality that was aerially mapped on the San Bernardino National Forest in 2008.

